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AUTHOR Diem, Richard A.; Fairweather, Peter G.
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ABSTRACT

This evaluation of the effectiveness of a computer assisted instructional program in basic literacy skills for inmates in a county jail covers the first year of the program. Instructional materials used were developed by Control Data Corporation for use on the PLATO system, and consisted of lessons in vocabulary, reading, spelling, arithmetic computation, and arithmetic problem solving. The reactions of both the prison population and the administrative staff of the Bexar County Detention Center (San Antonio) and their involvement in the program are discussed. Achievement gains of prisoners participating in CAI are compared with those of prisoners in a traditional instruction group, and some suggestions are offered for more effective use of CAI both for inmates and staff development courses. (RAO)

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An Evaluation of the Effectiveness of a Computer Assisted Instructional Program in Basic Literacy Skills in a County Jail*

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Richard A. Diem
The University of Texas at San Antonio
San Antonio, Texas

Peter G. Fairweather
WICAT, Inc.
Orem, Utah

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An Evaluation of the Effectiveness of a Computer Assisted Instructional Program in Basic Literacy Skills in a County Jail.

This paper will present an analysis of the effectiveness of a computer assisted instructional program in basic literacy skills. The program evaluated and analyzed was the Basic Skills Program, a component of an Adult Basic Skills Curriculum being developed by Control Data Corporation for use on the PLATO CAI system. This program consists of lessons in vocabulary, reading, spelling, arithmetic computation, and arithmetic problem solving.

The site used in this experiment was the Bexar County, San Antonio, Texas Detention Center. Although PLATO had been used in penal settings before, the BCDC was the first county jail to use either the PLATO system or the Basic Skills Package. Through a mini-block grant from the Law Enforcement Assistance Administration, and funds provided from the U.S. Bureau of Prisons, two PLATO terminals were installed as part of the Bexar County Detention Center Educational Program in November, 1977.

I. The Role of PLATO at Bexar County Detention Center

The computer assisted educational (CAE) program assumed a protean role at BCDC, changing radically as time passed. Furthermore, each segment of the BCDC community looked upon it differently. It is helpful, for the purpose of analysis, to divide the jail community into an array of sub-groups, namely: (1) inmates participating in jail education programs, (2) inmates not participating in jail education programs, (3) trustees, (4) education program staff, (5) chaplaincy staff, (6) guards assigned to the education area, (7) floor guards, (8) guard training supervisor staff, and (9) upper echelon jail and

sheriff's department administrators. To form an accurate picture of the role of the CAE System through a single description would be misleading. Therefore, a mosaic will be developed using the perspective of each of these groups as pieces.

1) Inmates participating in jail education programs generally viewed PLATO as an effective and pleasurable teaching device. Comments gleaned from participants during taped interviews suggested that the inmates valued the "privacy" afforded by PLATO, that is, the closed, one-on-one interaction that prevented other inmates from knowing about their performance or level. On the other hand, several inmates, anxious to attain their G.E.D. (General Equivalency High School Diploma) viewed some of the programed materials as sonehow "babyish". This perception was supported by comparing the content of PLATO sessions with the content of the traditional G.E.D. classes going on at the same time. Although it is never clear why an inmate enters the education program--boredom, desire to show off, legitimate self-improvement motivation,--each shares with all the others a common characteristic: impatience. Repeatedly, certain inmates needed convincing that the PLATO materials were designed for adults and that they were a part of a continuum that led to the high school equivalency certificate. Although the inmates responded well to animations incorporated in several lessons, the benefits of the graphics were offset by the perception that the materials were inappropriate for study by adults.

Inmates enrolled in other parts of the education program frequently expressed a strong desire to enter the PLATO component. This proved to be a problem for instructors in the more traditional G.E.D. classes who were not using the CAE system in terms of student motivation and attendance.

2) Inmates not participating in jail education programs were exposed directly to PLATO during visits to the law library and indirectly through comments made by fellow inmates enrolled in the PLATO component of the education program. Occasionally, seeing or hearing about PLATO stimulated otherwise reluctant inmates to enter the education program. However, some of the more recalcitrant inmates dismissed PLATO as another manipulative tool of the authorities. To them, being pleased by the animations, graphics, and human-like responses meant being duped. It should be said that these individuals did not take part in any of the other educational programs in the jail; in other words, their reaction was not specific to PLATO.

3) Trustees form a special group in any correctional institution. They are chosen because of special attributes not shared by other inmates that render them valuable to the administrators of the institution. The trustees in the education and law library programs were not enrolled in the education program and, therefore, had no formally scheduled opportunities to use PLATO. However, during the times that the facilities were not used, the trustees frequently availed themselves of the terminals. Quickly they discriminated the communication functions of the terminals and became adept at using the user list utility lesson, the "term talk," facility as well as conferencing lessons. These terms allowed the trustees "to talk" to others using the system. Comminicating with "outsiders", in conversations ranging from sports to politics, proved to be a strong stimulus towards using the system.

4) The education program staff at BCDC is a multifacted group, varied both in background and function. A core of two individuals, the director, and a teacher, function cooperatively with the chaplaincy

staff to implement the jail social service programs. To this are added an array of personnel funded by the Comprehensive Employment and Training Act (CETA) who function both as teachers and administrators.

The roles of these individuals change on almost a daily basis. For example, within the education program, subprograms dealing with employment skills, high school equivalency curricula, remedial academic curricula, art, and music are brought together to provide a tempting "instructional cafeteria" for the residents. It was expected that PLATO would be welcomed as a relief to the taxing demands of such a wide-ranging program. Instead, most of the instructional staff reacted with indifference--or, better, did not react at all. It was almost as if their present tasks were so demanding that they could not visualize the power of PLATO. Many of them did go through various lessons relevant to the areas dealt with in their classes and some examined portions of the Basic Skills materials to a limited degree. However, none, save the director, ever showed more than modest interest in PLATO.

The indifference to PLATO was supported by the structure of the education program. At BCDC the demand for social services always exceeds the ability to respond to that demand. With only two terminals operating, PLATO was used by only a small portion of the resident population, leaving a still unmanageable number of individuals to be treated through traditional means. As a result, PLATO did not impact traditional instruction at all, except, as mentioned before, by producing some attendance problems. In the future, PLATO will be used prescriptively within the regular classes with individuals diagnosed

as having specific instructional problems receiving special help via PLATO.

5) Chapliancy staff during the course of the first year of PLATO use have failed to utilize the terminals. This is due to the tremendous demands placed on their time and not because of any lack of interest.

6) Guards assigned to the education area greeted PLATO with alacrity for it appeared as a way to conduct education with a minimum of behavior problems. This alacrity suffered a bit when they realized the magnitude of the scheduling of inmates and the attendant transportation problems. During off hours, many of the guards amused themselves with PLATO using games such as "casino" and "checkers" which are available on the system.

7) Floor guards as well as special purpose correctional officers assigned to units such as booking or identification were introduced to PLATO shortly after its arrival through a series of inservice presentations. Although seemingly disconnected from the education program, they provided an example of the different stages through which acceptance to PLATO may develop. Initially the correctional officers were modestly impressed by the capabilities of PLATO, although it is certain that they failed to fully appreciate its instructional potential. A few weeks into the project brought rumblings of discontent from these same officers. Having heard about the cost of the terminals, they seemed to have mistakenly assumed that the administration had diverted funds which could have been used to give raises for the purpose of acquiring and maintaining PLATO. This resentment continued until the beginning of the development of correctional officer training materials which will use PLATO. The observation and questioning of many of these individuals for the purpose of gathering information for use with the

training materials brought about a sharp reversal of sentiments about PLATO and about the education program in general. In short, these officers felt that if they were doing a job for which a computer was needed to train others, then that job must be worthy of respect and, therefore, so were they. Because the source of this respect, the education program, required their respect in turn, PLATO became an accepted part of the jail community.

8) Guard training supervisor staff were not immediately enamored of PLATO which they viewed as primarily a resident-oriented service. Later, as the officers began to review material on PLATO specifically for correctional officer training, they changed their opinion substantially.

9) Upper echelon jail and sheriff's department administrators are aware of PLATO, its potential, and, in the end, are responsible for acquiring it. Basically, they view it as a means to provide a range of social services to inmates--services which correctional institutions are under considerable pressure to provide.

II. CAE Curriculum - Basic Skills

During the first year of operation a major curriculum development focus for this project was implementing and evaluating a specific CAE program package in the area of literacy skill development known as the Basic Skills Curriculum. The subjects covered included: vocabulary skills, reading, spelling, arithmetic computation, and arithmetic problem solving.

Two attempts were made to evaluate the overall effectiveness of the Basic Skills materials at BCDC. The first failed due to improper sampling from the inmate population. No attempt was made to select using length of confinement as a criterion. As a result, all of the

control group and all but three of the experimental group were transferred to the penitentary or were released prior to the conclusion of the experiment.

In early March, 1977, another pair of groups were selected, each containing 19 males. One group was assigned to the more-or-less traditional instruction associated with on-going pre-GED classes at BCDC. The other used the Basic Skills materials without exposure to the traditional format.

A word about the traditional instruction should suffice to describe it. Segregated, lock-step instruction is undertaken in reading, English usage, and mathematics. Group instruction is supplemented to some extent with limited individual instruction. Occasionally team-teaching is used to efficiently utilize the limited preparation time available to instructors.

Because of attrition, both groups were reduced in size to 15.

An efficient design to interpret the results would utilize instructional time as a covariant. However, estimates of attendance for the traditional group were inaccurate at best and would only reflect actual "physical" attendance. Therefore, a straightforward multivariate test of differences between the mean vectors of the two groups' gains (Hoteling's T^2 test) was employed. The pooled variance-covariance matrix was built out of two difference score matrices, one for each group.

Results are as follows:

MEAN GAINS (tenths of grade level)

	PLATO Group	Traditional Group
Vocabulary	1.2	-0.266
Reading	1.13	4.6
Spelling	-0.66	.733

	PLATO Group	Traditional Group
Arithmetic Compuation	12.6	.333
Arithmetic Problem Solving	8.4	4.733
Arithmetic Total	11.3	1.93

Hotelling's T^2 = 10.0874, df = 6/23 (read from table of F), (p less than .01)

The two apparently negative gains can safely be treated as zero--merely artifacts of testing error. The same is true for the arithmetic computation gain for the traditional instruction group.

This result shows that in general, achievement gains were greater for the PLATO group than those for the traditional group over the eight week instructional period.

This result should be qualified immediately, for it is clear that the gains of the PLATO group over the traditional instruction group were limited to arithmetic problem solving and computation. (The gains in arithmetic total, being a near linear combination of the other two, are ignored.) This result is not surprising in view of the greater amount of time the inmates spent on arithmetic using the Basic Skills materials.

Variation amongst individual gains is suggested by the following standard deviations (expressed in tenths of grade gains):

	PLATO	Traditional
Vocabulary	3.233	1.83
Reading	1.99	5.53
Spelling	1.43	2.7
AC	7.404	3.22
APS	7.[illegible]0	3.93
AT	6.00	6.22

Even superficial examination suggests that the two distributions are heterogeneous with respect to variance and probably also depart from a multivariate normal distribution. However, recent studies of such problems suggest that multivariate tests such as the one employed here are robust with respect to such departures from homogeneity and normality (Terwilliger, 1978).

The following regression equations illustration the relationship between gain and time spent in instruction. (Time is expressed in hours, gain, as usual, in tenths of grade level.)

$G_{vocabulary} = 1.59t + 15.29$

$G_{reading} = 3.64t + 13.08$

$G_{spelling} = -4.95t + 16.88$

Garith. comp. = 1.24t + 1.553 sig. at .01

Garith. prob. = 1.22t + 6.72 sig. at .01

Garith. tot. = 1.32 + 2.19 sig. at .01

The regression coefficients for vocabulary, reading, and spelling were not significant at an acceptable criterion level. For the sake of interpreting the intercept of the remaining three equations, the average time on PLATO was 17.21 hours. Each intercept should be interpreted as the average amount of time on PLATO before a detectable gain occurred.

Some Conclusions

To analyze, effectively, the usefulness of a computer assisted education program as part of a broad rehabilitative and educational program in a county jail setting will take more time. Through proper orientation and training with the CAE system many of the problems encountered during the pilot year's operation will be overcome and eliminated. It is clear, however, that to make this kind of project effective the staff, including both the education and guard segments, must become

directly involved in curriculum development and training. This can be done through inservice training components which, hopefully, will answer questions and allow for staff input.

While there were gain scores for those using the Basic Skills Program, it is also apparent that an adult centered curriculum is necessary to increase both interest and effectiveness of the PLATO system. The subjects of these courses need to address survival and job skills as well as basic literacy areas.

CAE, as part of a jail education program, can most effectively be used if it is integrated into an entire programmatic design. Its usefulness as a diagnostic and management tool will help detention education staffs, already stretched in a multitude of directions, if the system is properly understood and managed.

References

Terwilliger, W., Personal communication cited in Thorndike, R.M. Correlation Procedures Research. New York: Gardner Press, 1978.